

Claims

That which is claimed is:

1. Leather having durable antimicrobial properties, said leather comprising:
an organic bactericide; and
a fungicide;
wherein the fungicide and bactericide are present in said leather in a ratio between about 1:50 to about 10:1 fungicide to bactericide.
2. Leather according to claim 1 wherein the fungicide is present between about 200 ppm and about 5,000 ppm, and the bactericide is present between about 500 ppm and about 10,000 ppm based on the weight of the goods
3. Leather according to claim 1 wherein the bactericide is selected from the group consisting of triclosan, a biguanide, poly(oxyethylene-(dimethylimino)ethylene(dimethylimino)ethylenedichloride), isothiazolinone, and quaternary ammonium compounds.
4. Leather according to claim 3 wherein the bactericide is triclosan.
5. Leather according to claim 3 wherein the bactericide is polyhexamethylene biguanide.
6. Leather according to claim 1 wherein the fungicide is selected from the group consisting of tolyldiiodomethylsulfone, zinc 2-pyridinethiol-1-oxide, propiconazole, thiabendazole, and tebuconazole.
7. Leather according to claim 6 wherein said fungicide is tolyldiiodomethylsulfone.

8. Leather according to claim 1 wherein said fungicide and bactericide are exhausted into the interior of said leather.
9. Leather according to claim 8 wherein said leather contains at least 1000 ppm of said fungicide and at least 1000 ppm of said bactericide.
10. Leather according to claim 9 wherein said bactericide is triclosan and said fungicide is tolyldiiodomethylsulfone.
11. Leather according to claim 1 wherein said leather exhibits acceptable efficacy after five washings.
12. Leather according to claim 11 wherein said leather exhibits zero growth of microbes after five washings when tested in accordance with AATCC Test Method 30 Part III.
13. An antimicrobial composition for aqueous treatment of leather comprising:
 - a bactericide, and
 - a fungicide;wherein the fungicide and bactericide are present in the composition in a ratio between about 1:50 to about 10:1 fungicide to bactericide.
14. An antimicrobial composition according to claim 13 wherein the fungicide is present in the composition between about 200 ppm and about 5,000 ppm, and the bactericide is present in the composition between about 500 ppm and about 10,000 ppm based on the weight of the goods treated.
15. An antimicrobial composition according to claim 13 wherein the bactericide is selected from the group consisting of triclosan, a biguanide, poly(oxyethylene-(dimethylimino)ethylene(dimethylimino)ethylenedichloride), isothiazolinone, and quaternary ammonium compounds.

16. An antimicrobial composition according to claim 15 wherein the bactericide is triclosan.
17. An antimicrobial composition according to claim 15 wherein the bactericide is polyhexa-methylene biguanide.
18. An antimicrobial composition according to claim 13 wherein the fungicide is selected from the group consisting of tolyldiiodomethylsulfone, zinc 2-pyridinethiol-1-oxide, propiconazole, thiabendazole, and tebuconazole.
19. An antimicrobial composition according to claim 18 wherein said fungicide is tolyldiiodomethylsulfone.
20. An antimicrobial composition according to claim 13 wherein said fungicide and bactericide are exhausted into the interior of said leather.
21. An antimicrobial composition according to claim 20 wherein said bactericide is triclosan and said fungicide is tolyldiiodomethylsulfone.
22. A method for aqueous treatment of leather to impart durable antimicrobial characteristics, the method comprising the steps of:
 - cleaning the leather,
 - a first soaking of the leather in an antimicrobial composition in the presence of an emulsifier wherein the antimicrobial composition comprises a bactericide and a fungicide and wherein the fungicide and bactericide are present in the composition in a ratio between about 1:50 to about 10:1 fungicide to bactericide,
 - soaking the leather in an aqueous solution containing a tanning agent, and
 - rinsing the leather.

23. A method according to claim 22 further comprising a first soaking of the leather in fat liquors and wherein the first soaking of the leather in an antimicrobial composition occurs prior to or concurrent with the first soaking of the leather in fat liquors.
24. A method according to claim 23 further comprising a second soaking of the leather in fat liquors and a second soaking of the leather in an antimicrobial composition wherein said second soaking of the leather in an antimicrobial composition occurs prior to or concurrent with the second soaking of the leather in fat liquors.
25. A method according to claim 24 further comprising the step of rinsing the leather between the first soaking in fat liquors and the second soaking in fat liquors.
26. A method according to claim 23 wherein the step of soaking the leather in a solution of tanning agent occurs prior to the first soaking of the leather in an antimicrobial composition.
27. A method according to claim 23 wherein the step of soaking the leather in a solution of tanning agent occurs after the first soaking of the leather in an antimicrobial composition.
28. A method according to claim 22 wherein the fungicide is present in the antimicrobial composition between about 200 ppm and about 5,000 ppm, and the bactericide is present in the composition between about 500 ppm and about 10,000 ppm.
29. A method according to claim 22 wherein the bactericide is selected from the group consisting of triclosan, a biguanide, poly(oxyethylene-

(dimethylimino)ethylene(dimethylimino)ethylenedichloride), isothiazolinone, and quaternary ammonium compounds.

30. A method according to claim 29 wherein the bactericide is triclosan.
31. A method according to claim 29 wherein the bactericide is polyhexamethylene biguanide.
32. A method according to claim 22 wherein the fungicide is selected from the group consisting of tolyldiiodomethylsulfone, zinc 2-pyridinethiol-1-oxide, propiconazole, thiabendazole, and tebuconazole.
33. A method according to claim 32 wherein said fungicide is tolyldiiodomethylsulfone.
34. A method according to claim 3 wherein the step of first soaking of said leather in said antimicrobial composition comprises exhausting said fungicide and bactericide into the interior of said leather.
35. A method according to claim 22 wherein said leather is soaked in said antimicrobial composition for a time sufficient to exhaust at least 1000 ppm of said fungicide and at least 1000 ppm of said bactericide into said leather.
36. A method according to claim 35 wherein said bactericide is triclosan and said fungicide is tolyldiiodomethylsulfone.
37. A method according to claim 22 further comprising the step of finishing the leather.
38. A method according to claim 37 further comprising forming products from said leather.

39. A method according to claim 38 wherein said products include clothing, shoes, boots, coats, baggage, clothing accessories, tents, outdoor equipment, and upholstery.